

# **Inventory of Butterflies at Jewel Cave National Monument**



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**Submitted to:**

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## EXECUTIVE SUMMARY

In May 2004 the author was contracted by the National Park Service to conduct a butterfly inventory of Jewel Cave National Monument (JCNM) located in Custer County of the Black Hills of South Dakota. During the 2004 flight season butterfly surveys were conducted to document species diversity and abundance as well as determine the presence or absence of any species of concern.

Fifty-three species were documented for JCNM. No federally listed butterfly species of concern were found.

## INTRODUCTION AND METHODS

There are approximately 14,500 species of butterflies worldwide, with almost 700 of them occurring in the United States and Canada. One hundred seventy-seven species were reported for South Dakota in 2002, of which 118 are documented for Custer County, (Marrone, 2002).

Four sampling periods, late May, and mid June, mid July, and mid August, were selected for this project to maximize the number of butterfly species encountered as well as coincide with the flight periods of three species listed as species of concern by the U.S. Forest Service. A standardized data form was used to record butterfly species on each site. Information regarding number per species, sex, condition of individuals, nectar sources, and behavioral aspects was recorded. Additional data was also collected on temperature, time of day, habitat type(s), and weather conditions.

The census method known as a “checklist count”, as noted by Royer, *et al.* (1998), was used because of its effectiveness in confirming the presence of as many butterfly species as possible in a relative short period of time and effort. This casual or random technique for observing butterflies allows the surveyor to select likely concentration sites such as nectar sources, larval host sites, and potential habitat for specific species and avoid large areas with high densities of non-native plant species.

Baited butterfly traps, often referred to as *Agrias* traps due to their success in capturing that genus in tropical environments, were also used to sample butterfly species found in wooded areas. The trap design is similar to that sold by BioQuip Products, Gardena, CA. Each trap consists of a 36-inch high nylon mesh cylinder with 15-inch diameter metal rings at top and bottom. The top is covered with heavy-duty cloth. A 3.5-inch mesh trap lip attached at the bottom to an inner metal ring provides an eight-inch opening. A 16-inch square plywood base supports the bait container and provides a landing platform for incoming butterflies. The platform is attached to the cylinder with nylon cord that allows an entry opening of approximately two inches in height. Traps were suspended from large cottonwood, aspen, or ponderosa pine trees approximately five feet above ground level. Bait used was a mixture of molasses, apple cider, brown sugar, stale beer, and ripened bananas.

Common and scientific names of butterflies used in this report follow the book, *Field Guide to South Dakota Butterflies* by this author. Common names of plants found during these surveys were taken from the recent publication by Larson and Johnson, (1999).

## STUDY AREA

Jewel Cave National Monument is a 1,355-acre park located in Custer County in the south-central portion of the Black Hills of South Dakota. The climax community of the park is ponderosa pine forest; however, a recent fire has burned much of the area resulting in a mosaic of meadows, dead ponderosa pine, and live ponderosa pine. Upon consulting with JCNM natural resource personnel, reviewing the authors past collection records, and conducting a preliminary survey for potential habitats during the first visit, four study sites were selected (Figure 1). Location and description of each site is presented in Table 1. During each sampling period, each site was searched for 15 minutes to 1.5 hours by walking through favorable habitat for butterflies. Length of time spent was determined by success of finding butterflies and size of the site.

## RESULTS AND DISCUSSION

A list of butterflies and the numbers observed at each site are presented in Tables 2-5. A total of 53 butterfly species, including one new county record, was encountered during the survey (Table 6). Voucher specimens were collected for selected species and have been provided to the Northern Great Plains Inventory & Monitoring Coordinator at MRNM (Table 7).

No threatened or endangered butterfly species presently listed by the U.S. Fish and Wildlife Service are known to occur in South Dakota. Three species – Regal Fritillary (*Speyeria idalia*), Ottoe Skipper (*Hesperia ottoe*), Arogos Skipper (*Atrytone arogos*) - listed as “species of concern” are reported for the Black Hills, (Marrone, 2002); however, none were found during this survey. The probability of finding these species, with the exception of the Regal Fritillary, is low because JCNM lacks suitable habitat. Refer to Appendix A for specific details on habitat needs and distribution of these species.

The Clouded Sulphur, Western Pine Elfin, Common Wood-Nymph, Pearl Crescent, Edwards’ Fritillary, and Melissa Blue were the six most abundant species observed during the survey. All of these species are common to the Black Hills area.

Of the fourteen species listed as rare, the Juba Skipper was the most unlikely find and a new county record. Only three other observations are reported for this butterfly in South Dakota (Marrone, 2002). Western South Dakota is on the eastern edge of this skipper’s range (Opler and Wright, 1998).

Due to the variability in the size of each area sampled and the length of time spent at each site, caution should be used when making comparisons between sites. In general, butterfly diversity (number of species per site) was greatest where at least a portion of the site had a semi-permanent or permanent water source such as a stream or spring and abundant nectar sources. These areas include meadows, stream bottoms, and trails, all in open sunny locations.

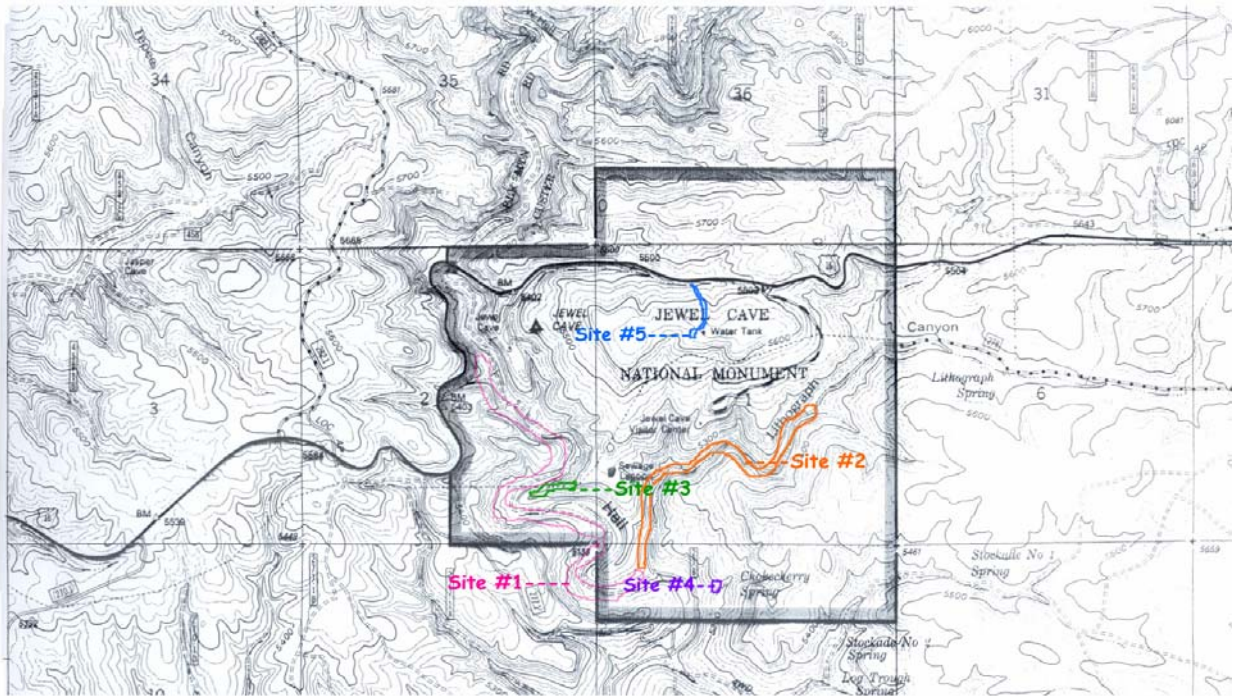


Figure 1. Location of survey sites number 1-5 at Jewel Cave National Monument.

**Table 1. Location and description of butterfly collection sites at Jewel Cave National Monument.**

<b>SITE NUMBER</b>	<b>COUNTY</b>	<b>LOCATION</b>	<b>DESCRIPTION</b>	<b>COMMENTS</b>
1	Custer	T4S,R2E,S12,NW1/4, and T4S,R2E,S2,E1/2	Large canyon with intermittent stream in ponderosa pine forest. Open areas along stream bottom, hiking trail, and burned sites.	Abundant nectar sources in open areas include chokecherry, golden aster, wild lettuce, fleabane, purple coneflower, thistles, goldenrod, harebell, and blackeyed Susan.
2	Custer	T4S,R2E,S1,S1/2	Large canyon with intermittent stream in ponderosa pine forest. Open areas along stream bottom, hiking trail, and burned sites.	Nectar sources include chokecherry, dogwood, yellow coneflower, wild bergamot, blackeyed Susan, thistles, and curlycup gumweed.
3	Custer	T4S,R2E,S2,SE1/4	Open rocky ridgetop below powerline with short-grass prairie community.	Nectar sources include stemless hymenoxys, scarlet gaura, northern bedstraw, purple coneflower, asters, goldenrod, gayfeather, and wavy-leafed thistle. Sideoats grama common.
4	Custer	T4S,R2E,S12,N1/4	Spring with associated wet plant community.	Nectar sources and larval hostplants include, violets, wild bergamot, blackeyed Susan, stinging nettle, and thistles. Area has problem with invasion of Canada thistle and some leafy spurge.
5	Custer	T4S,R2E,S1,N1/2	Open disturbed ridge and hilltop area used for equipment storage; open area within old burn of ponderosa pine forest.	Nectar and hostplants include thistles, western wallflower, vervain, purple coneflower, wild bergamot, goldenrod, spreading dogbane, and thistles.

**Table 2. List of butterflies found on four survey sites at Jewel Cave National Monument during May 28, 2004.**

COMMON NAME	SCIENTIFIC NAME	SURVEY SITE NUMBER				TOTAL	COMMENTS
		1	2	3	4		
Canadian Tiger Swallowtail	<i>Papilio canadensis</i>		1			1	fresh condition
Olympia Marble	<i>Euchloe olympia</i>	1		1		2	
Clouded Sulphur	<i>Colias philodice</i>	6	6	2	1	9	
Purplish Copper	<i>Lycaena helloides</i>	2				2	
Western Pine Elfin	<i>Callophrys erythron</i>	20+	20+	4	4	48+	abundant, nectaring on chokecherry
Western Tailed-Blue	<i>Everes amyntula valeriae</i>	2	1	2	3	8	
Silvery Blue	<i>Glaucopsyche lygdamus oro</i>	6	2	2	4	14	
Melissa Blue	<i>Lycaeides melissa</i>	1				1	
Greenish Blue	<i>Plebejus saepiolus amica</i>				2	2	
Edwards' Fritillary	<i>Speyeria edwardsii</i>		1			1	fresh condition
Gorgone Checkerspot	<i>Chlosyne gorgone carlota</i>	10	6	6	1	23	
Pearl Crescent	<i>Phyciodes tharos</i>	2	4	2	3	11	
Tawny Crescent	<i>Phyciodes batesii</i>				1	1	fresh condition, early record
Pale Crescent	<i>Phyciodes pallida barnesi</i>	26+	20+		1	47+	common
Variable Checkerspot	<i>Euphydryas chalcedona bernadetta</i>	15+	20+	2		37+	common
Milbert's Tortoiseshell	<i>Nymphalis milberti</i>		2			2	
Red Admiral	<i>Vanessa atalanta rubria</i>	2	2		2	6	
Painted Lady	<i>Vanessa cardui</i>	2	2			4	
Prairie Ringlet	<i>Coenonympha tullia benjamini</i>	4	2			6	
Ochre Ringlet	<i>Coenonympha tullia ochracea</i>		1			1	fresh condition
Uhler's Arctic	<i>Oeneis uhleri varuna</i>	2	1			3	
Silver-spotted Skipper	<i>Epargyreus clarus</i>		3		2	5	
Dreamy Duskywing	<i>Erynnis icelus</i>				1	1	
Afranius Duskywing	<i>Erynnis afranius</i>			1		1	
Persius Duskywing	<i>Erynnis persius fredericki</i>		2		4	6	
Common Checkered Skipper	<i>Pyrgus communis</i>			2		2	
Common Sootywing	<i>Pholisora catullus</i>		2			2	

**Table 3. List of butterflies found on five survey sites at Jewel Cave National Monument during June 13, 2004. Survey site #5 was added to the study on this date.**

COMMON NAME	SCIENTIFIC NAME	SURVEY SITE NUMBER					TOTAL	COMMENTS
		1	2	3	4	5		
Canadian Tiger Swallowtail	<i>Papilio canadensis</i>		1				1	fresh condition
Two-tailed Swallowtail	<i>Papilio multicaudatus</i>		4				4	fresh condition
Western White	<i>Pontia occidentalis</i>	4			2	4	10	
Olympia Marble	<i>Euchloe olympia</i>		1			1	2	
Clouded Sulphur	<i>Colias philodice</i>	6	3		4	2	15	
Orange Sulphur	<i>Colias eurytheme</i>	1	1		2	2	6	
Christina Sulphur	<i>Colias christina krauthii</i>				1		1	
Purplish Copper	<i>Lycaena helloides</i>	2					2	
Western Pine Elfin	<i>Callophrys erythron</i>	2	20+		4	4	30+	common at site #2
Western Tailed-Blue	<i>Everes amyntula valeriae</i>	1	4	1	2	4	12	
Silvery Blue	<i>Glaucopsyche lygdamus oro</i>	4	3	1	8	1	17	some specimens worn
Melissa Blue	<i>Lycaeides melissa</i>	6	3		3	3	15	worn specimens
Greenish Blue	<i>Plebejus saepiolus amica</i>	1			2		3	
Variegated Fritillary	<i>Euptoieta claudia</i>	2			1		3	
Edwards' Fritillary	<i>Speyeria edwardsii</i>	2	20+			15	37+	common
Coronis Fritillary	<i>Speyeria coronis</i>					2	2	
Northwestern Fritillary	<i>Speyeria hesperis lurana</i>		2			1	3	fresh condition
Gorgone Checkerspot	<i>Chlosyne gorgone carlota</i>	1					1	
Pearl Crescent	<i>Phyciodes tharos</i>	2	2	1	6	3	14	
Tawny Crescent	<i>Phyciodes batesii</i>	1	1		4		6	
Pale Crescent	<i>Phyciodes pallida barnesi</i>	6					6	worn condition
Mourning Cloak	<i>Nymphalis antiopa</i>		1				1	
Milbert's Tortoiseshell	<i>Nymphalis milberti</i>		1			1	2	
Red Admiral	<i>Vanessa atalanta rubria</i>	1	1		2	2	6	
Painted Lady	<i>Vanessa cardui</i>	2	2		1	2	7	
Weidemeyer's Admiral	<i>Limenitis weidemeyerii oberfoelli</i>	1	20+		1		22+	common at site #2
Prairie Ringlet	<i>Coenonympha tullia benjamini</i>	1	1			1	3	
Silver-spotted Skipper	<i>Epargyreus clarus</i>	1	5		7	2	15	
Northern Cloudywing	<i>Thorybes pylades</i>				1		1	
Common Checkered Skipper	<i>Pyrgus communis</i>	2	4		1		7	
Garita Skipperling	<i>Oarisma garita</i>	3			2		5	
Juba Skipper	<i>Hesperia juba</i>					1	1	county record, slightly worn female
Common Roadside Skipper	<i>Amblyscirtes vialis</i>		1				1	

**Table 4. List of butterflies found on five survey sites at Jewel Cave National Monument during July 18, 2004.**

COMMON NAME	SCIENTIFIC NAME	SURVEY SITE NUMBER					TOTAL	COMMENTS
		1	2	3	4	5		
Western White	<i>Pontia occidentalis</i>		1				<b>1</b>	
Cabbage White	<i>Pieris rapae</i>		2				<b>2</b>	
Clouded Sulphur	<i>Colias philodice</i>	15+	15+	6	6	6	<b>48+</b>	common
Orange Sulphur	<i>Colias eurytheme</i>		10		2	1	<b>13</b>	
Christina Sulphur	<i>Colias christina krauthii</i>	2	4		1	2	<b>9</b>	
Dainty Sulphur	<i>Nathalis iole</i>		2				<b>2</b>	worn condition
Coral Hairstreak	<i>Satyrium titus</i>					1	<b>1</b>	county record, worn condition
Melissa Blue	<i>Lycaeides melissa</i>	6	4	1	2	2	<b>15</b>	
Boisduval's Blue	<i>Icaricia icarioides pambina</i>		3				<b>3</b>	
Manitoba Fritillary	<i>Speyeria aphrodite manitoba</i>	15+	10	2		3	<b>30+</b>	common, mostly worn condition
Northwestern Fritillary	<i>Speyeria hesperis lurana</i>	15+	6	1	1	4	<b>27+</b>	common
Pearl Crescent	<i>Phyciodes tharos</i>	8	6	4	4	2	<b>24</b>	nectaring on blackeyed Susan
Northern Crescent	<i>Phyciodes cocyta</i>		2		2		<b>4</b>	
Hoary Comma	<i>Polygonia gracilis zephyrus</i>	2	8				<b>10</b>	
Mourning Cloak	<i>Nymphalis antiopa</i>	4	2	1			<b>7</b>	
Red Admiral	<i>Vanessa atalanta rubria</i>	1*	1				<b>2</b>	*captured in baited butterfly trap
Weidemeyer's Admiral	<i>Limenitis weidemeyerii oberfoelli</i>	1*	10		2		<b>13</b>	*captured in baited butterfly trap
Prairie Ringlet	<i>Coenonympha tullia benjamini</i>	10	3		2		<b>15</b>	fresh condition
Common Wood-Nymph	<i>Cercyonis pegala nephele</i>	15	20+		3		<b>38+</b>	common
Dark Wood-Nymph	<i>Cercyonis oetus charon</i>	4	4		2		<b>10</b>	
Silver-spotted Skipper	<i>Epargyreus clarus</i>	1	4		1	1	<b>7</b>	
Common Checkered Skipper	<i>Pyrgus communis</i>	2	2			1	<b>5</b>	
Kiowa Skipper	<i>Euphyes vestris kiowah</i>		10+		10+	2	<b>22+</b>	fresh condition, common in wet areas
Common Roadside Skipper	<i>Amblyscirtes vialis</i>		1				<b>1</b>	very worn condition

**Table 5. List of butterflies found on five survey sites at Jewel Cave National Monument during August 16, 2004.**

COMMON NAME	SCIENTIFIC NAME	SURVEY SITE NUMBER					TOTAL	COMMENTS
		1	2	3	4	5		
Western White	<i>Pontia occidentalis</i>					1	<b>1</b>	
Clouded Sulphur	<i>Colias philodice</i>	6	4	7		4	<b>21</b>	
Orange Sulphur	<i>Colias eurytheme</i>	2	1	1	1		<b>5</b>	
Melissa Blue	<i>Lycaeides melissa</i>	6		8	1	4	<b>19</b>	
Variegated Fritillary	<i>Euptoieta claudia</i>	3	3	2			<b>8</b>	
Manitoba Fritillary	<i>Speyeria aphrodite manitoba</i>					3	<b>3</b>	
Edwards' Fritillary	<i>Speyeria edwardsii</i>		10		2		<b>12</b>	
Northwestern Fritillary	<i>Speyeria hesperis lurana</i>	4	4	3	1	2	<b>14</b>	
Pearl Crescent	<i>Phyciodes tharos</i>	6					<b>6</b>	
Green Comma	<i>Polygonia faunus hylas</i>	1					<b>1</b>	captured in baited butterfly trap
Gray Comma	<i>Polygonia progne</i>		1				<b>1</b>	captured in baited butterfly trap
Red Admiral	<i>Vanessa atalanta rubria</i>		2		1		<b>3</b>	
Common Wood-Nymph	<i>Cercyonis pegala nephele</i>	10+	10+		7	4	<b>31+</b>	
Dark Wood-Nymph	<i>Cercyonis oetus charon</i>		2*			2	<b>4</b>	*captured in baited butterfly trap
Common Checkered Skipper	<i>Pyrgus communis</i>		2	8	2		<b>12</b>	
Western Branded Skipper	<i>Hesperia colorado idaho</i>	4	8	15+	3	4	<b>34+</b>	
Kiowa Skipper	<i>Euphyes vestris kiowah</i>				2		<b>2</b>	

**Table 6. Number and abundance of butterflies found on five sites at Jewel Cave National Monument during May 28, June 13 and 15, July 18, and August 16, 2004.**

COMMON NAME	SCIENTIFIC NAME	SITE NUMBER					TOTAL / ABUNDANCE*	
		1	2	3	4	5		
Canadian Tiger Swallowtail	<i>Papilio canadensis</i>		2				2	R
Two-tailed Swallowtail	<i>Papilio multicaudatus</i>		4				4	U
Western White	<i>Pontia occidentalis</i>	4	1		2	5	12	C
Cabbage White	<i>Pieris rapae</i>		2				2	R
Olympia Marble	<i>Euchloe olympia</i>	1	3	1		1	6	U
Clouded Sulphur	<i>Colias philodice</i>	33+	28	15	11	12	99+	A
Orange Sulphur	<i>Colias eurytheme</i>	3	12	1	5	3	24	A
Christina Sulphur	<i>Colias christina krauthii</i>	2	4		2	2	10	C
Dainty Sulphur	<i>Nathalis iole</i>		2				2	R
Purplish Copper	<i>Lycaena helloides</i>	4					4	U
Coral Hairstreak	<i>Satyrium titus</i>					1	1	R
Western Pine Elfin	<i>Callophrys eryphon</i>	27	35	4	8	4	78	A
Western Tailed-Blue	<i>Everes amyntula valeriae</i>	3	5	3	5	4	20	A
Silvery Blue	<i>Glaucopsyche lygdamus oro</i>	10	5	3	12	1	31	A
Melissa Blue	<i>Lycaeides melissa</i>	19	7	9	6	9	50	A
Greenish Blue	<i>Plebejus saepiolus pembina</i>	1			4		5	U
Boisduval's Blue	<i>Icaricia icarioides pembina</i>		3				3	U
Variegated Fritillary	<i>Euptoieta claudia</i>	5	3	2	1		11	C
Manitoba Fritillary	<i>Speyeria aphrodite manitoba</i>	15	10	2		6	33	A
Edwards' Fritillary	<i>Speyeria edwardsii</i>	2	31		2	15+	50+	A
Coronis Fritillary	<i>Speyeria coronis</i>					2	2	R
Northwestern Fritillary	<i>Speyeria hesperis lurana</i>	19+	12	4	2	7	44+	A
Gorgone Checkerspot	<i>Chlosyne gorgone carlota</i>	11	6	6	1		24	A
Pearl Crescent	<i>Phyciodes tharos</i>	18	12	7	13	5	55	A
Northern Crescent	<i>Phyciodes cocyta</i>		2		2		4	U
Tawny Crescent	<i>Phyciodes batesii lakota</i>	1	1		5		7	U
Pale Crescent	<i>Phyciodes pallida barnesi</i>	26+	20+		1		47	A
Variable Checkerspot	<i>Euphydryas chaldedona bernadetta</i>	15+	20+	2			37	A
Green Comma	<i>Polygonia faunus hylas</i>	1					1	R
Hoary Comma	<i>Polygonia gracilis zephyrus</i>	2	8				10	C
Gray Comma	<i>Polygonia progne</i>		1				1	R
Mourning Cloak	<i>Nymphalis antiopa</i>	4	3	1			8	U
Milbert's Tortoiseshell	<i>Nymphalis milberti</i>		3			1	4	U
Red Admiral	<i>Vanessa atalanta rubria</i>	4	6		5	2	17	A
Painted Lady	<i>Vanessa cardui</i>	4	4		1	2	11	C
Weidemeyer's Admiral	<i>Limenitis weidemeyerii oberfoelli</i>	2	30+		3		35+	A
Prairie Ringlet	<i>Coenonympha tullia benjamini</i>	15	6		2	1	24	A
Ochre Ringlet	<i>Coenonympha tullia ochracea</i>		1				1	R
Common Wood-Nymph	<i>Coenonympha pegala nephele</i>	25+	30+		10	4	69+	A
Dark Wood-Nymph	<i>Cercyonis oetus charon</i>	4	6		2	2	14	C
Uhler's Arctic	<i>Oeneis uhleri varuna</i>	2	1				3	U
Silver-spotted Skipper	<i>Epargyreus clarus</i>	2	12		10	3	27	A

**Table 6. (continued).**

Northern Cloudywing	<i>Thorybes pylades</i>				1		<b>1</b>	<b>R</b>
Dreamy Duskywing	<i>Erynnis icelus</i>				1		<b>1</b>	<b>R</b>
Afranius Duskywing	<i>Erynnis afranius</i>			1			<b>1</b>	<b>R</b>
Persius Duskywing	<i>Erynnis persius fredericki</i>		2		4		<b>6</b>	<b>U</b>
Common Checkered Skipper	<i>Pyrus communis</i>	4	8	2	3	1	<b>18</b>	<b>A</b>
Common Sootywing	<i>Pholisora catullus</i>		2				<b>2</b>	<b>R</b>
Garita Skipperling	<i>Oarisma garita</i>	3			2		<b>5</b>	<b>U</b>
Juba Skipper	<i>Hesperia juba</i>					1	<b>1</b>	<b>R</b>
Western Branded Skipper	<i>Hesperia colorado idaho</i>	4	8		3	4	<b>19</b>	<b>A</b>
Kiowa Skipper	<i>Euphyes vestris kiowah</i>		10		2	2	<b>14</b>	<b>C</b>
Common Roadside Skipper	<i>Amblyscirtes vialis</i>		1				<b>1</b>	<b>R</b>
<b>TOTAL SPECIES</b>		<b>34</b>	<b>43</b>	<b>16</b>	<b>31</b>	<b>26</b>	<b>53</b>	<b>R – 14</b> <b>U – 12</b> <b>C – 7</b> <b>A – 20</b>

\*R = Rare (< 3)

U = Uncommon (3-8)

C = Common (9-14)

A = Abundant (>14)

**Table 7. List of butterfly vouchers collected by the author at Jewel Cave National Monument.**

COMMON NAME	SCIENTIFIC NAME	LOCATION	HABITAT	DATE	COMMENTS
Canadian Tiger Swallowtail	<i>Papilio canadensis</i>	T4S,R2E,S1S1/2	canyon bottom of ponderosa pine forest	12 June 2004	male in fresh condition
Two-tailed Swallowtail	<i>Papilio multicaudatus</i>	T4S,R2E,S1S1/2	canyon bottom of ponderosa pine forest	15 June 2004	male in fresh condition
Western White	<i>Pontia occidentalis</i>	T4S,R2E,S12,NW1/2	canyon bottom of ponderosa pine forest	13 June 2004	male
Western White	<i>Pontia occidentalis</i>	T4S,R2E,S12,NW1/2	canyon bottom of ponderosa pine forest	18 July 2004	female in fresh condition
Olympia Marble	<i>Euchloe olympia</i>	T4S,R2E,S1S1/2	canyon bottom of ponderosa pine forest	28 May 2004	
Orange Sulphur	<i>Colias eurytheme</i>	T4S,R2E,S12,N1/4	spring, wet area	13 June 2004	male
Christina Sulphur	<i>Colias christina krauthii</i>	T4S,R2E,S12,N1/4	spring, wet area	15 June 2004	male
Purplish Copper	<i>Lycaena helloides</i>	T4S,R2E,S2,E1/2	open area along stream bottom	28 May 2004	male
Western Pine Elfin	<i>Callophrys eryphon</i>	T4S,R2E,S1S1/2	canyon bottom of ponderosa pine forest	28 May 2004	female
Western Tailed-blue	<i>Everes amyntula valeriae</i>	T4S,R2E,S1S1/2	canyon bottom of ponderosa pine forest	13 June 2004	female
Silvery blue	<i>Glaucopsyche lygdamus oro</i>	T4S,R2E,S2,E1/2	open area along stream bottom	28 May 2004	2 males
Melissa Blue	<i>Lycaeides melissa</i>	T4S,R2E,S2,E1/2	open area along stream bottom	13 June 2004	male
Greenish Blue	<i>Plebejus saepiolus amica</i>	T4S,R2E,S12,N1/4	spring, wet area	13 June 2004	2 males
Greenish Blue	<i>Plebejus saepiolus amica</i>	T4S,R2E,S12,N1/4	spring, wet area	28 May 2004	male
Boisduval's Blue	<i>Icaricia icarioides pembina</i>	T4S,R2E,S1S1/2	canyon bottom of ponderosa pine forest	18 July 2004	2 males
Variegated Fritillary	<i>Euptoieta claudia</i>	T4S,R2E,S2,E1/2	open area along stream bottom	16 Aug. 2004	2 males
Manitoba Fritillary	<i>Speyeria manitoba</i>	T4S,R2E,S1,N1/2	open hilltop	16 Aug. 2004	male
Coronis Fritillary	<i>Speyeria coronis</i>	T4S,R2E,S1,N1/2	open hilltop	15 June 2004	2 males
Northwestern Fritillary	<i>Speyeria hesperis luraana</i>	T4S,R2E,S2,E1/2	open area along stream bottom	18 July 2004	4 males

**Table 7. (continued).**

Gorgone Checkerspot	<i>Chlosyne gorgone carlota</i>	T4S,R2E,S2,E1/2	open area along stream bottom	28 May 2004	
Pearl Crescent	<i>Phyciodes tharos</i>	T4S,R2E,S12,N1/4	spring, wet area	13 June 2004	male
Northern Crescent	<i>Phyciodes cocyta</i>	T4S,R2E,S1S1/2	canyon bottom of ponderosa pine forest	18 July 2004	male
Tawny Crescent	<i>Phyciodes batesii lakota</i>	T4S,R2E,S12,N1/4	spring, wet area	28 May 2004	early record, male in fresh condition
Pale Crescent	<i>Phyciodes pallida barnesi</i>	T4S,R2E,S2,E1/2	open area along stream bottom	28 May 2004	common
Variable Checkerspot	<i>Euphydryas chaldedona bernadetta</i>	T4S,R2E,S2,E1/2	open area along stream bottom	28 May 2004	common
Green Comma	<i>Polygonia faunus hylas</i>	T4S,R2E,S2,E1/2	open area along stream bottom	16 Aug. 2004	captured in baited butterfly trap
Hoary Comma	<i>Polygonia gracilis zephyrus</i>	T4S,R2E,S1S1/2	canyon bottom of ponderosa pine forest	18 July 2004	
Mourning Cloak	<i>Nymphalis antiopa</i>	T4S,R2E,S2,E1/2	open area along stream bottom	18 July 2004	
Milbert's Tortoiseshell	<i>Nymphalis milberti</i>	T4S,R2E,S1S1/2	canyon bottom of ponderosa pine forest	28 May 2004	
Weidemeyer's Admiral	<i>Limenitis weidemeyerii oberfoelli</i>	T4S,R2E,S1S1/2	canyon bottom of ponderosa pine forest	13 June 2004	common
Prairie Ringlet	<i>Coenonympha tullia benjamini</i>	T4S,R2E,S2,E1/2	open area along stream bottom	13 June 2004	
Ochre Ringlet	<i>Coenonympha tullia ochracea</i>	T4S,R2E,S1S1/2	canyon bottom of ponderosa pine forest	28 May 2004	
Common Wood-Nymph	<i>Coenonympha pegala nephele</i>	T4S,R2E,S2,E1/2	open area along stream bottom	18 July 2004	common
Dark Wood-Nymph	<i>Cercyonis oetus charon</i>	T4S,R2E,S2,E1/2	open area along stream bottom	18 July 2004	male
Dark Wood-Nymph	<i>Cercyonis oetus charon</i>	T4S,R2E,S1S1/2	canyon bottom of ponderosa pine forest	16 Aug. 2004	2 females
Uhler's Arctic	<i>Oeneis uhleri varuna</i>	T4S,R2E,S2,E1/2	open area along stream bottom	28 May 2004	
Northern Cloudywing	<i>Thorybes pylades</i>	T4S,R2E,S12,N1/4	spring, wet area	14 June 2004	
Dreamy Duskywing	<i>Erynnis icelus</i>	T4S,R2E,S12,N1/4	spring, wet area	28 May 2004	
Afranius Duskywing	<i>Erynnis afranius</i>	T4S,R2E,S2,SE1/4	open rocky ridge	28 May 2004	

**Table 7. (continued).**

Persius Duskywing	<i>Erynnis persius fredericki</i>	T4S,R2E,S12,N1/4	spring, wet area	28 May 2004	
Garita Skipperling	<i>Oarisma garita</i>	T4S,R2E,S2,E1/2	open area along stream bottom	13 June 2004	
Juba Skipper	<i>Hesperia juba</i>	T4S,R2E,S1,N1/2	open disturbed hilltop	15 June 2004	female
Western Branded Skipper	<i>Hesperia colorado idaho</i>	T4S,R2E,S2,SE1/4	open rocky ridge	16 Aug. 2004	3 males, 2 females
Kiowa Skipper	<i>Euphyes kiowah</i>	T4S,R2E,S1S1/2	canyon bottom of ponderosa pine forest	18 July 2004	
Common Roadside Skipper	<i>Amblyscirtes vialis</i>	T4S,R2E,S1S1/2	canyon bottom of ponderosa pine forest	28 May 2004	

## MANAGEMENT ISSUES AND RECOMMENDATIONS TO PARK MANAGEMENT

1. **Management for ecosystem biodiversity would greatly benefit all native butterfly species.** Native habitats important to butterflies should be protected and/or enhanced, especially at water sources such as springs and streams. Moffat and McPhillips (1993) discuss several management methods, including controlled burns, mowing, and grazing, specific for prairie endemic butterfly species that would be applicable to JCNM.
2. Invasion of non-native grasses and exotic plants, especially smooth brome grass and Canada thistle, into native habitats should be prevented. Smooth brome grass is a problem adjacent to Hell Canyon hiking trail. Use of broadleaf herbicides to control Canada thistle near a water source such as a spring (example Chokecherry Spring), stream, or pond should be prohibited to protect important butterfly nectar sources and larval hostplants. Noxious weed control should be by mechanical means (mowing or hand cutting) if practical. Controlled burning in selected areas would enhance native plant diversity and may check the spread of exotics.
3. Open areas should be maintained/created, especially at stream bottoms, meadows, and ridge tops. Recent wild fires at JCNM have helped create/restore some of these areas. Prescribed burns should be conducted periodically to enhance/maintain plant diversity and create additional open areas. Encroachment of ponderosa pine into these open areas could be prevented by eliminating seedlings and young trees with mechanical means or prescribed fires. Any management technique that would preserve meadows and prevent plant succession would greatly benefit most butterfly species at JCNM. Suggested areas for management includes Site #3 along the powerline and Hell Canyon and Lithograph Canyon bottoms.
4. Areas disturbed by new road construction or other development projects should be re-planted with grasses, wild flowers, and shrubs native to the area. Restoration effort should be attempted at site #5 (Water Tank Hill).
5. Periodically (at least once in every 4 years) monitor butterfly abundance and diversity.
6. Comments and recommendations specific to each site include:

**(A). Site #1 (Hell Canyon)** – Maintain much of the openness and subsequent plant diversity created by the recent fire, especially at the creek bottom, ridgetops and meadows.



Photo 1. Photo of Hell Canyon showing abundance of flowering forbs, especially wild bergamot, in open areas created in 2001 by the Jasper wildfire.

**(B). Site #2 (Lithograph Canyon)** – Prevent the encroachment of ponderosa pine into creek bottom areas so that butterfly nectar sources and larval hostplants can thrive.



Photo 2. Photo of Lithograph Canyon bottom showing abundance of longspur violet, an important larval hostplant for many fritillaries, including Edwards' Fritillary.

**(C). Site #3 (Powerline Ridge)** – Develop and/or maintain sunny open areas on ridgetops for a variety of plants, especially native forbs and grasses.



Photo 3. Open areas along ridgetops, as shown here below the powerline, provide habitat for nectar-producing flowering forbs such as this dotted gayfeather. Sideoats grama, a native grass and larval hostplant for several butterflies (including *Ottoe Skipper*), was common at this site.

**(D). Site #4 (Chokecherry Spring)** – Springs and their associated plant communities should be protected. Chemical control methods of noxious weeds such as leafy spurge and Canada thistle at these areas may threaten the existence of violets and other butterfly larval hostplants.



Photo 4. Two male Silvery Blue butterflies sipping moisture from mud at Chokecherry Spring.

**(E). Site #5 (Water Tank Hill)** – Man-made disturbed areas such as that found along roadsides and construction sites often create habitat for “weedy plants” and several butterfly species.



Photo 5. Some butterflies such as this Common Checkered Skipper prefer disturbed areas like that found at the Water Tank site.

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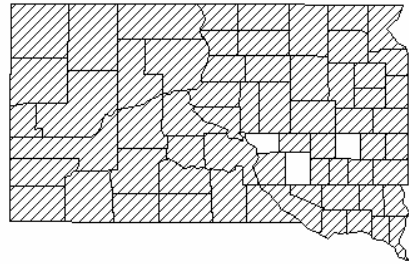
## Regal Fritillary

*Speyeria idalia*

**Description:** Wingspan: 2.9-3.8 inches. Females are larger and darker than males. The upperside of the forewing is reddish orange with black and white spots. Hindwings are velvety black with two rows of spots; both rows of spots are cream-colored in the female, outer row rust-orange in the male. The underside of the hindwing is brown with large silver spots.

**Similar Species:** Only large fritillary in South Dakota with black hindwings.

**Distribution and Habitat:** Historical range extended from New England to North Carolina and westward to eastern Colorado, Wyoming, and southeastern Montana. No longer occurs in much of New England and rapidly declining over much of its range except the prairie states. Common in northeastern South Dakota in tall-grass prairie sites near marshes, undisturbed mixed-grass prairie areas along Missouri River breaks, and the Fort Pierre National Grassland. Generally restricted to areas of the state where sufficient native grasslands exist.



**Early Stages:** The caterpillar is yellowish brown with black markings and yellowish bands; black dorsal spines have silvery white bases.

**Larval Host Plants:** Various species of violets, including prairie violet and Nuttall's violet.

**Adult Energy Sources:** Nectar from a wide variety of flowers, including purple coneflower, gayfeather, hoary vervain, thistles, wild bergamot, alfalfa, and milkweeds. Whorled milkweed, near Oahe Dam in Stanley County, was noted to be a favored nectar source in 1983.

**Flight Period:** One brood, with flight dates ranging from June 12 to September 16. Males appear in mid-June and fly until August; female flight period is early July to mid-September. After hatching, the unfed caterpillar overwinters on the ground beneath leaves.

**General Comments:** Population size seems to fluctuate from year to year. Large tracts of native prairie with abundant wildflowers, such as Samuel Ordway Prairie managed by The Nature Conservancy near Leola, S.D., are needed to protect this species from further decline. The South Dakota Natural Heritage Program is currently monitoring this species.

**Special References:** Kelly, L., and D.M. Debinski. 1998. Relationship of host plant density to size and abundance of the Regal Fritillary *Speyeria idalia* Drury (Nymphalidae). J. Lepid. Soc. 52(3):262-276.

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## Ottoe Skipper

*Hesperia ottoe*

**Description:** Wingspan: 1.20-1.55 inches. Uppersides are bright orange. Males have narrow diffuse dark borders and a black stigma in the forewing that contains gray-brown scales. The female has wider more diffuse dark borders and several yellowish white spots in the forewing. The underside of the hindwing is pale orange with no markings in the male and occasionally a faint row of spots in the female.

**Similar Species:** Pawnee Skipper flies in August-September, and the male has yellow scales in the stigma. Dakota Skipper is smaller with darker undersides.

**Distribution and Habitat:** Very local and generally uncommon to rare throughout South Dakota and its entire range. Found in scattered, relatively undisturbed, mixed-grass to tall-grass prairie sites such as the area below Fort Randall Dam, Charles Mix County, and the Crystal Springs Preserve, managed by The Nature Conservancy, near Clear Lake, Deuel County.

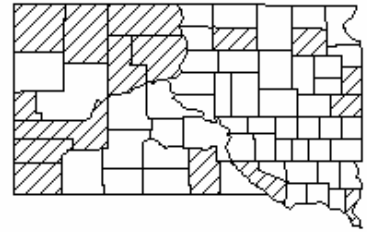
**Early Stages:** The caterpillar is greenish brown; head dark brown.

**Larval Host Plants:** Native prairie grasses, including little bluestem, big bluestem, and sideoats grama.

**Adult Energy Sources:** Nectar from many flowers, but especially those of coneflowers, gayfeathers, asters, milkweeds, alfalfa, leadplant, black-eyed Susan, and sunflowers.

**Flight Period:** One brood from late June to August with peak flight in mid-July; dates extend from June 23 to August 4. Overwinters as a partially grown caterpillar in a leaf shelter.

**General Comments:** Males perch on tall flowers such as purple coneflowers and thistles to watch for females. The South Dakota Natural Heritage Program monitors the Ottoe Skipper. Native prairie sites with abundant nectar sources need protection in order for this species to survive.



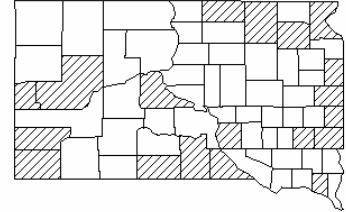
## Arogos Skipper

*Atrytone arogos*

**Description:** Wingspan: 1.10-1.25 inches. Uppersides are yellow-orange with wide dark borders. The female has broader dark wing margins that diffuse into, and nearly cover over, the orange in the hindwing. Males lack a stigma. The underside of the hindwing is golden yellow with pale veins.

**Similar Species:** Delaware Skipper is brighter orange and has a more distinct border and dark veins.

**Distribution and Habitat:** Local and occasionally common throughout South Dakota but may be absent from northwestern corner. Found in relatively undisturbed prairies and grasslands such as Mirror Lake Game Production Area, Lawrence County, and South Scalp Creek Recreation Area, near Fort Randall Dam, Gregory County.



**Early Stages:** The caterpillar is light green with a dark green dorsal stripe; head gray with orange streaks.

**Larval Host Plants:** Big bluestem and little bluestem. Caterpillars feed on leaves and live in nests constructed of two leaves sewn together with silk.

**Adult Energy Sources:** Purple coneflower, prairie coneflower, blackeyed Susan, and thistles.

**Flight Period:** One brood with peak flight in July; dates extend from June 25 to July 26. Overwinters as a partially grown caterpillar in a leaf cocoon about three feet above the ground.

**General Comments:** Males perch near host plants in mid-afternoon to watch for females. The South Dakota Natural Heritage Program is currently monitoring this species.

**Special References:** Royer, R.A., and G.M. Marrone. 1992. Conservation status of the Arogos Skipper (*Atrytone arogos*) in North and South Dakota. A report to the U.S. Dept. of the Interior, U.S. Fish and Wildlife Service, Denver, CO.